



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/766,255	01/17/2001	William L. Betts	061607-1361	8278

24504 7590 08/04/2004

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
100 GALLERIA PARKWAY, NW
STE 1750
ATLANTA, GA 30339-5948

EXAMINER

LUGO, DAVID B

ART UNIT PAPER NUMBER

2637

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/766,255

Applicant(s)

BETTS, WILLIAM L.

Examiner

David B. Lugo

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9-13,15-20,22-26,28 and 30-33 is/are rejected.
- 7) ☒ Claim(s) 2,8,14,21 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2001 and 24 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. The objections to the drawings, specification and claims have been withdrawn as applicant has addressed the matters raised in the previous Office action.
2. Applicant's arguments filed 5/24/04 have been fully considered but they are not persuasive.
3. Regarding claims 1, 7, 13, 20 and 28, applicant argues that Tzannes teaches an example BAT ordered by subchannel number, and it is coincidence that the bits per subchannel for one tone happen to be different from bits per subchannel for the adjacent tone. However, Tzannes is still considered to disclose the claimed limitations. Tzannes discloses a bit allocation table where a first number of bits is assigned to a first tone, and a second number of bits is assigned to a second tone, wherein the first number is different from the second number and the first tone is adjacent to the second tone, and therefore teaches the claimed limitations.
4. Regarding claims 16 and 23, applicant argues that Tzannes fails to disclose that the first and second tones are selected based on correlated noise affecting the first and second tones. However, Tzannes discloses that the number of bits modulated on each subchannel depend on the signal to noise ratio of that subchannel. The tones are thus considered to be selected as candidates for bit allocation based on correlated noise affecting the tones, which influences the signal to noise ratios of the subchannels.
5. The rejections of claims 1, 3-7, 9-13, 15-20, 22-26, 28 and 30-33 are maintained, and are stated below.

Art Unit: 2637

Drawings

6. The drawing replacement sheet of Figure 3 was received on 5/24/04. The replacement sheet is acceptable.

Claim Objections

7. Claims 1-12, and 14 are objected to because of the following informalities:

- a. Claim 1, line 5, before “memory”, “[KH1]” should be deleted.
- b. Claim 7, at the end of line 6, “; and” should be deleted.
- c. Claim 14, line 2, after “tones”, “[KH2]” should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 13, 16-20 and 23-26 are rejected under 35 U.S.C. 102(e) as being anticipated by

Tzannes U.S. Patent 6,498,808.

10. Regarding claim 13, Tzannes discloses a method of transmitting data comprising receiving a bit allocation table (BAT) sent by a far end receiver (col. 13, lines 41-42), where the BAT shown in Table 1 (col. 2, lines 16-38) illustrates that the bits assigned to each tone is different from the bits assigned to the adjacent tones, wherein the BAT also contains the gain for each subchannel (col. 20, lines 1-10) and the bit and gain information is assigned to the tones.

Art Unit: 2637

11. Regarding claim 16, the bits assigned to each tone are determined according to the noise on the subchannels (col. 1, lines 61-65).
12. Regarding claims 17 and 18, the BAT sent by the receiver is adapted during system operation (col. 12, lines 43-44).
13. Regarding claim 19, the bits assigned to the tones comprise a portion of a DMT symbol.
14. Regarding claim 20, Tzannes discloses a DMT system comprising a bit allocation table (BAT) sent by a far end receiver (col. 13, lines 41-42), where the BAT shown in Table 1 (col. 2, lines 16-38) illustrates that the bits assigned to each tone is different from the bits assigned to the adjacent tones, wherein the BAT also contains the gain for each subchannel (col. 20, lines 1-10) the bit and gain information is assigned to the tones, and the system may include computer readable medium for storing information (see claim 49).
15. Regarding claim 23, the bits assigned to each tone are determined according to the noise on the subchannels (col. 1, lines 61-65).
16. Regarding claims 24 and 25, the BAT sent by the receiver is adapted during system operation (col. 12, lines 43-44).
17. Regarding claim 26, the bits assigned to the tones comprise a portion of a DMT symbol.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2637

19. Claims 1, 4-7, 10-12, 28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzannes in view of Helms et al. U.S. Patent 6,144,695.

20. Regarding claims 1 and 7, Tzannes discloses a dual latency DMT communication system comprising a bit allocation table (BAT) stored in memory, (col. 2, lines 16-38) where the bits assigned to each tone is different from the bits assigned to the adjacent tones. Tzannes further discloses that the DMT symbol BAT may be varied (col. 12, lines 25-33) and the BAT also contains the gain for each subchannel as defined in the ANSI standard (col. 20, lines 1-10).

21. Tzannes does not expressly disclose a tone ordering element.

22. Helms et al. disclose a tone ordering element 230 in the dual latency DMT system of Fig. 2A. It would have been obvious to one of ordinary skill in the art to use a tone ordering element as disclosed by Helms et al. in the dual latency system of Tzannes in order to comply with the ANSI standard (see Helms et al., col. 2, lines 40-42).

23. Regarding claims 4 and 10, the bits assigned to each tone are determined according to the noise on the subchannels (col. 1, lines 61-65).

24. Regarding claims 5 and 11, the BAT sent by the receiver is adapted during system operation (col. 12, lines 43-44).

25. Regarding claims 6 and 12, the bits assigned to the tones are a portion of a DMT symbol.

26. Regarding claim 28, Tzannes discloses a dual latency DMT communication system comprising a bit allocation table (BAT) shown in Table 1 (col. 2, lines 16-38) where the bits assigned to each tone is different from the bits assigned to the adjacent tones. Tzannes further discloses that the DMT symbol BAT may be varied (col. 12, lines 25-33), and that the BAT contains the gain for each subchannel as defined in the ANSI standard (col. 20, lines 1-10).

Art Unit: 2637

27. Tzannes does not expressly disclose that the transmitter of the communication system comprises a tone ordering element, and that the receiver comprises a convolutional decoder and a bit ordering element.

28. Helms et al. disclose a transmitter in Fig. 2A comprising a tone ordering element 230, and a receiver in Fig. 2B comprising a convolutional decoder 280 outputting decoded tone ordered interleaved data, and a bit ordering element 275 for reordering the convolutionally decoded tone ordered interleaved data.

29. It would have been obvious to one of ordinary skill in the art to use a tone ordering element, convolutional decoder, and bit ordering element as disclosed by Helms et al. in the dual latency system of Tzannes in order to comply with the ANSI standard (see Helms et al., col. 2, lines 16-19).

30. Regarding claim 31, the bits assigned to each tone are determined according to the noise on the subchannels (col. 1, lines 61-65).

31. Regarding claim 32, the BAT sent by the receiver is adapted during system operation (col. 12, lines 43-44).

32. Regarding claim 33, the bits assigned to the tones comprise a portion of a DMT symbol.

33. Claims 3, 9, 15, 22 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzannes in view of Helms et al. as applied above, and further in view of Levin U.S. Patent 5,822,374.

34. Regarding claims 3, 9, 15, 22 and 30, Tzannes and Helms et al. disclose a DMT communication system as described above, but do not expressly disclose raising the power on a first group of tones and lowering the power on a second group of tones in the bit assignment.

Art Unit: 2637

35. Levin discloses a method for fine gains adjustment in an ADSL system in Fig. 7 where a gain of a bin is adjusted up while a gain of another bit is adjusted down by a corresponding amount.

36. It would have been obvious to one of ordinary skill in the art to use the fine gain adjustment of Levin in the DMT system of Tzannes and Helms et al. in order to provide the best BER without changing the transmit power (Levin, col. 2, lines 42-53).

Allowable Subject Matter

37. Claims 2, 8, 14, 21 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and amended to overcome all objections set forth in this Office action.

Conclusion

38. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2637

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **David B. Lugo** whose telephone number is **(703) 305-0954**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Jay Patel**, can be reached at **(703) 308-7728**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dl
8/3/04


KHAI TRAN
PRIMARY EXAMINER 8/3/04